# Rattlesnakes

Snake Identification and
Medical Treatment of Snakebite

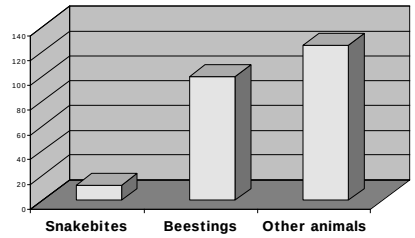
Presented by:
Gordon Worley, RN

## Learning Objectives

Upon completion of this program, the participant will be able to:

1. Recognize venomous snakes native to California.
2. Describe the identifying characteristics of Pit Vipers.
3. List the safety precautions that can reduce the risk of snakebite.
4. Describe how to identify crotalid snake envenomations.
5. Describe the proper field and hospital treatment of crotalid snakebite.
6. Identify potential complications of crotalid snakebite and it's treatment.

## Annual Deaths from Venomous Animals

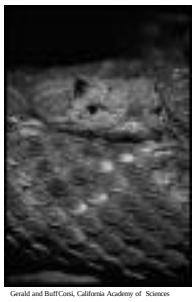



Source: H. Renollet, MD, UCDMC Poison Center, 1992

## Distinguishing Characteristics of Pit Vipers

1. Facial pits
2. Elliptical pupil
3. Triangular head, distinctive from the rest of the body
4. Single row of sub-caudal scales
5. Rattles on the end of the tail

## Facial Pits



Gerald and Buff Corsi, California Academy of Sciences

- A depression or pit in the snake's face
- Believed to be a heat-detecting organ
- Sensitive to about 14 inches away

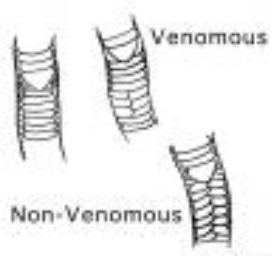
## Elliptical Pupil

- "Cats Eyes"
- Relatively poor visual acuity
- Non-Venomous native snakes have round pupils

## Triangular Head

- Wide Head
- Narrow Neck
- Heavy-set body

## Single Row of Sub-caudal Scales




## Rattles

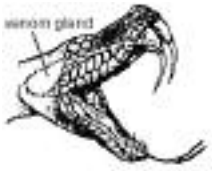
- Formed as the snake sheds it's skin
- Age is **NOT** indicated by the number of rattles
- Characteristic buzz occurs when tail vibrates from 20-85 times per second
- ***STRIKES MAY OCCUR WITHOUT A WARNING BUZZ***

"This is your side of the family, you realize."

## Venom Apparatus

- Venom Glands
- Venom Ducts
- Fangs

## Venom Glands




- Venom glands are located in the upper jaw
- Jaw muscles contract to inject venom
- Snake can control amount of venom injected

## Fangs

- Fangs fold flat against roof of snake's mouth
- May vary from 8 to 20 mm in length
- Can puncture rubber or leather boots
- Fangs shed with skin
- May be up to four punctures from a single bite

## Venom

- Crotalid venom consists of a mixture of enzymes, proteins and peptides
- Venom causes;
  - Cell damage
  - Tissue necrosis
  - Coagulation changes
  - Shock

## Rattlesnake Behavior

- Relatively inactive animals
- No internal thermoregulatory mechanism
- Strict carnivores
- Diet usually consists of rodents, birds and bird eggs, frogs, lizards and other snakes
- Secure prey by lying coiled and immobile next to animal trails and burrows

## Rattlesnake Behavior

- Well camouflaged in their native habitat

## Rattlesnake Strikes

- May strike up to 1/2 of snake's body length
- Snake opens mouth and erects fangs
- Rapid lunge forward
- Buries fangs and injects venom

## Envenomation

- As many as 20-25% of snakebites will have no envenomation
- Injection of venom starts the digestive process

## Additional Risk Factors:

- Youth

  "Honest Mom, I wasn't trying to catch it…"

- Ethanol & Testosterone

  "Ya'll hold my beer and watch this…"

## Common Misconceptions

- The venom of baby rattlesnakes is not more potent than that of adults
- Snakes will not always rattle before striking
- The number of rattles does not indicate the snake's age

## Crotalidae Species in California

- Northern Pacific rattlesnake - *C. viridis oreganus*
- Southern Pacific rattlesnake - *C. viridis helleri*
- Western diamondback rattlesnake - *C. atrox*
- Red diamondback rattlesnake - *C. ruber ruber*
- Sidewinder - *C. cerastes*
- Mojave rattlesnake - *C. s. scutulatus*

## Northern Pacific Rattlesnake

*Crotalus viridis oreganus*

- Native to northern California, Oregon and Washington
- Adult length 36-48 inches (max. 5 feet)
- Sea level to 11,000 feet
- Highly toxic venom

## Range of the Northern Pacific Rattlesnake

*Crotalus viridis oreganus*

## Northern Pacific Rattlesnake

*Crotalus viridis oreganus*

- Wide Range of Coloration
- Wide Range of Habitats

## Other Venomous Snakes in North America

- Crotalids are found in 46 of the lower 48 states
- Only other species native to the continental US is the Coral Snake

## Exotic Venomous Snakes

Gordon Worley, 2002

- Zoological Parks
  - Will usually have stock of antivenin and treatment information
- Private Collectors

## Identification of Snakebites

**The 2 "P's"**

- Puncture
- Pain

**The 2 "E's"**

- Edema
- Erythema

## Identification of Snakebites, cont.

**Pain**

- Immediate, Burning Pain

**Puncture**

- May be one to four puncture wounds

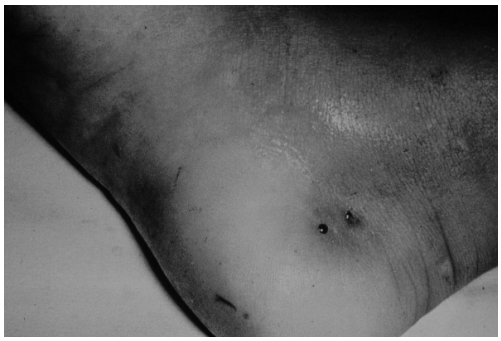
## Identification of Snakebites, cont.

**Edema (Swelling)**

- Usually occurs within 5-15 minutes
- If no swelling in 30 minutes, envenomation is unlikely

**Erythema (skin discoloration)**

- Ecchymosis and discoloration may develop within a few hours
- Hemmoragic blebs and petechiae are common



## Systemic Reactions

- Diaphoresis
- Chills
- Weakness
- Parasthesias (tongue, mouth, scalp, feet)
- Metallic Taste
- Fasiculations (muscle twitching in face, back and neck)

## Severe Systemic Reactions

- Vital Sign Changes
  - Elevated temperature
  - Tachycardia
  - Tachypnea
  - Hypotension
- Pulmonary Edema
- Seizures
- Other Neurologic Signs

## Sequelae

- Secondary Infection
- Renal Failure from Tubular Necrosis
- DIC
- Serum Sickness

## Treatment of Crotalid Envenomations

- Pre-Hospital Treatment
- Hospital E.D. Treatment

## Pre-Hospital Treatment

- Get victim and rescuers safely away from the snake
  - Even if the snake is dead, it may still bite
- **DO NOT** attempt to catch or kill the snake
- **DO NOT** bring the snake to the hospital

## Pre-Hospital Treatment, cont.

- Calm victim
- Remove constricting clothing
- Assess for signs of a bite
- Measure & record the circumference of the extremity
  - Mark where the measurement was taken
- Gently cleanse the area around the bite with soap & water

## Pre-Hospital Treatment, cont.

- Splint the extremity, at or below heart level
- Apply the "Extractor" device (if available)
- Evacuate as quickly as possible to a hospital
- Reassess frequently, keep victim calm

## The Extractor

The only suction type treatment recommended by the Wilderness Medical Society.

## Ineffective Treatments

- Ice Packs
- Cutting the skin
- Suction by mouth
- Constricting Bands/Tourniquets
- Electric Shock
- Pressure Dressings
- Alcohol (external or internal)

## Hospital Treatment

- Complete all pre-hospital treatment steps, if not already done
- Measure and mark swelling, document serial measurements

## Hospital Treatment, cont.

- Establish IV access
- Draw routine labs, including coag studies
- Administer horse serum skin test

## Hospital Treatment, cont.

- Administer Crotalid antivenin
- Observe for evidence of allergic reaction
- Reassess swelling and mark changes

## CroFab™

Crotalidae Polyvalent Immune Fab -- Ovine

Savage Laboratories

## Hospital Treatment, cont.

- Consider antibiotics, tetanus prophylaxis, pain meds
- Monitor for;
  - Serum sickness/allergic reaction
  - Compartment system
  - Infection

## The Best Treatment - DONT GET BITTEN!!!

1. Wear appropriate footwear such as boots or high-top hiking shoes.
2. Watch where you are walking.
3. Step up onto logs or rocks rather than over them.
4. Don't place your hands on unseen ledges or into animal holes.
5. Don't turn rocks or boards over with your bare hands.
6. Don't try to kill, catch or molest a venomous snake.
7. Don't hike by yourself.
8. Learn to identify the venomous snakes in your area.

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